

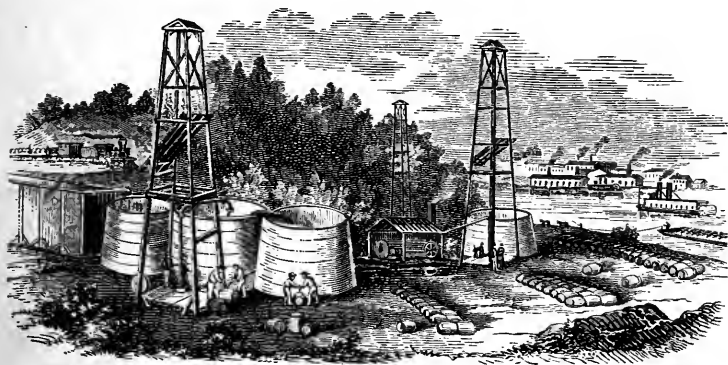
C. W. Mackay
Vol. I.

No. 10.

THE
PETROLEUM MONTHLY,

DEVOTED TO THE
Interests of the Oil Business.

AUGUST, 1871.



J. H. BOWMAN, }
RICHARD LINN, }

Editors and Publishers.

OIL CITY, PA.

TERMS:
THREE DOLLARS PER ANNUM IN ADVANCE.

—o—
1871.

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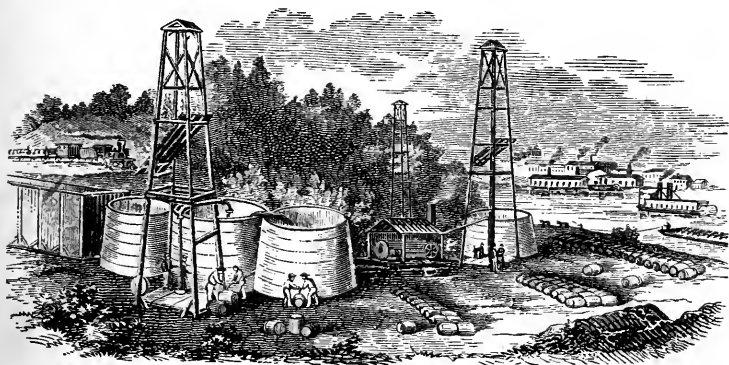
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THE

Petroleum Monthly.

VOL. I. OIL CITY, PA., AUGUST, 1871. No. 10.

THE ANGELL BELT THEORY.

IN our last number we quoted the correspondence of the N. Y. *Tribune* concerning this theory, and which gives to Mr. C. D. Angell a degree of prominence very seldom reached by any operator. This prominence is justly due Mr. Angell, and the more so because his success is the result of sound study and careful reasoning. We reserve for the September number all argument concerning the *belt theory* or the *theory of belts*, at which time we shall present such drawings as will give clearer insight and better ideas of this geological phenomenon than can possibly be had without.

A few days since we had the pleasure of taking personal observations of the developments upon that part of the Angell Belt first operated. Transported by the Alleghany Valley railway to Foster, a station a dozen miles below Franklin on the Alleghany river, we find ourselves in one of the wildest yet most beautiful portions of the canon; and this the only true canon of the Appalachian system, or to be found in the eastern half of this continent, has scenery both wild and beautiful. We might add, that here, at Foster Station, is found the greatest depth of this canon, which extends from the very fountain heads of the river to its mouth at Pittsburg. Unlike any other eastern river, this one begins her course only to plunge at once into an ever deepening gulch or trough, and to roar and foam, and dash and fret against the rocky walls of a prison, which here assumes the stateliest proportions. Not a plain smiles upon our river in all her course. Neither hills or mountains bring their feet to be washed by the pure tide. We climb the precipitous side of the canon, and stand panting with the exertion, full seven hundred feet above the narrow thread of silver sparkling and glinting below in the morning sun.

We are upon Mount Hope and the very brink of the precipice. Below us, almost under our feet, is the railway station. The course of the railroad at this point is almost north and south, but this is not at once detected. The ride from Oil City—darting, dashing and whirling into every point of the compass, does not give one the brightest possible idea of direction—and without compass or sun one is as completely lost as to bearings as if in mid ocean. We are upon the highest part of an immense plain stretching away in all directions, and with sufficient rolling and undulation to relieve the monotony of distance and extent. Before us is a great yawning chasm, irregularly semi-circular in form, the arc just below and the points losing themselves in the abrupt curves of the canon to the right and left at less than the distance of a mile, and the noble river and all evidence of her direction or destination are lost entirely.

We said before, that following the tortuous winding of the river and road were not calculated to preserve an idea of latitude and longitude, or of direction. While gazing earnestly upon the vast expanse of forest and field before us, and wrapped in thought of the strange conformation of the oil region, we were interrupted by one of the party, who asked us to point in the direction of Franklin. We knew we would be excused if we made a mistake, but we were not in a mood to furnish fun at our own expense. We nobly resolved to show that our geography had not been in vain. With a look of commiseration upon the party whose joke would be pointless, we slowly raised our index and leveled it triumphantly in the exact direction of ——— *the classic shades of Butler!* We were only 180° out of the way. We have neglected to mention the comforting fact that we had the good fortune to meet on the train Mr. S. L. Avery, the scientific assistant of Mr. Angell.

Mr. Avery is a graduate of Cornell University, and an old-time pupil of Prof. Alex. Winchell, at the University, of Michigan; a gentleman of high literary culture as well as scientific acquirements, and a most companionable fellow for a' that.

Under the guidance of Mr. Blakeslee, the efficient superintendent of development, we visited Mr. Angell's wells at this place, and after noting their peculiar location, we confess to having our ideas of the "belt theory" enlarged most astonishingly. Let the reader imagine himself in our position: standing upon the top of a seventy-two feet derrick upon the top of Mount Hope—when you go inquire for No. 1, Buffalo Lease—one gets a view from this elevation which well repays the labor of climbing a derrick ladder.

Looking directly across the river to the north, we can see the derricks of Bully Hill in the distance, and beyond these, beyond another turn in the river, a good eye can just discern the towering derricks of the Milton Farm. Were our observatory but a score of feet higher, we could no doubt see the busy streets of Bredinsburg, and the complacent form and glowing features of its munificent founder. And further on, Reno, Charley and Shaffer Runs, Rouseville, Blood Hill and McCray's, all in the same range, while but a little to the right is Oil City, with her tall churches and thousand railroads; and on the left Franklin, with her lubricating oil and poor-house troubles. Now this is a view of the belt, and an elucidation of the problem of fact really grand. The exact direction, as we find it by consulting the compass is north ten degrees east.

Reversing ourselves, we scan the developments of the Angell belt theory, which is now so tangible that the monthly dividends amount to more than fifty per cent. of the capital stock. These developments extend in a right line, the furthest derrick being a mile and a half away, and the intervening space is thickly studded with derricks, and the accompanying paraphernalia of producing wells. The puff, puff of the engines remind us of the scattering fire of a skirmish line, but no reports reach us, except, perhaps, that a new well is completed—"a ninety barreler." But these same quiet puffs tell us of fabulous wealth being poured forth. In the canon, just beyond the furthestmost derrick, is Scrubgrass, with her well attested and valuable wells and territory.

Since the theory of continuous lines or belts of oil producing territory has declared actual dividends, of course more or less operators indorse it, and, without knowing much of geology, or right lines, even, make some ludicrous moves to find its *bearings* or *crossings*. It is related by one heavy operator, who dead-heads among the spirits of departed greasers for scientific information, that he was greatly exercised over the successful operations of Mr. Angell at Foster, and almost wild when he found that Mr. A. had really a belt based on surveys, and that the immense wells were the result of logic and not of luck, nor yet spiritual manifestation. Of course, Mr. Angell kept the direction of the belt to himself, and, of course, our heavy operator made it lively for the spirits, hardly giving them time to sleep, so eager were his importunities that they would show him where it *crossed*.

He spent days and weeks traveling over the ground and wandering along the river banks, seeking a revelation. Finally, however, the spirits entered into him, and drove him violently down a steep place to the water, and revealed the long-looked for spot. The ecstasy of

that moment was too great. The thought that his family would now be placed above want, and his little home in Titusville relieved of its mortgages, completely unmanned him, and he was on the point of fainting, when he was discovered by good Samaritans passing that way, and "*brought too*" with a hat full of water. His first words were: "It c—c—c—crosses h—here."

It is cruelly added that "*the spot*" was two miles from the true line. This evident inaccuracy on the part of the "*spirits*," strange to say, did not cause our operator to lose faith in them. He accounts for it in this wise: The belt isn't straight, but zig-zag, and the spirits thought that if they perchance missed the "*zig*" they would hit the "*zag*."

We are under many obligations to Mr. Avery and Mr. Blakeslee, whose kindness greatly assisted us in making some scientific observations, the result of which we will try and prepare for our next.

NAPHTHA AS A FUEL FOR MANUFACTURING PURPOSES.

PETROLEUM is a natural product that is, perhaps, even more wonderful than it is plentiful. The part of it which is commonly called "kerosene" has superseded every thing except gas for purposes of illumination. The part known as "residuum," or "tar," enters largely into the composition of paraffine and machinery oils, while the fluid known as "naphtha," or "benzine," one of the lightest and—especially, in its highest specific gravities—the most volatile of liquids, is the only material from which, by mechanical process, gas for burning can be made in positions where coal gas is not available—as in private country residences, palace cars, &c. The supply of naphtha is, however, in excess of the demand. It is, at the same time, the main source of profit to refiners, since the margin on manufacturing kerosene has become so close. The abundance of the supply, therefore, combined with the consequent low prices and the absolute necessity to the manufacturer of selling it at a profit, have caused the refiners of New York to revive the subject of burning it in their factories instead of coal. If they can so burn it at a profit, petroleum will then have the unique distinction, among all natural products, of furnishing the fuel necessary for its own manufacture, and for its separation into three different substances.

Those, however, who are examining the subject of utilizing naphtha as a fuel for manufacturing purposes, find great difficulty in deciding at what price it would be cheaper than coal. Their indecision is the consequence of the fact that an amount of mechanical intelligence, commensurate with the novelty and importance of the problem, has not yet been applied to devise a means of burning it that would obviate the danger of explosion from the gases which naphtha generates. Only two different inventions have yet been tried for burning it. One of them was to run the fluid through pipes with small holes in them, a few inches apart, and then to set fire to the liquid, which, after burning a few minutes, would heat the pipes to a degree that would vaporize the naphtha, when it would burn like ignited coal gas issuing from ordinary beds. This method of burning it was, however, found to be objectionable, on account of involving the construction of furnaces and chimneys specially designed to secure its perfect combustion, and it was, consequently, abandoned. The other, and the simpler means of burning naphtha, is that of running the liquid into a metal basin after an ignited substance has been placed in the basin. This method is still in use under the boilers of some of our refineries, although manufacturers do not yet dare to employ it under their stills, for fear of augmenting the danger of explosion, to which petroleum stills are always more or less subject. Experts, therefore, have not yet promulgated any conclusions in the matter. But it is well that it should be followed to the end. The moment it shall be established that naphtha, at four cents per gallon, is cheaper to burn than coal at four dollars per ton, the demand for it as a fuel for general manufacturing purposes will render the refining interest a good deal more independent than it now is.—*Iron Age.*

EXPERIMENTS IN TESTING PETROLEUM.

BY PROFESSOR ATTFIELD,

Professor of Practical Chemistry to the Pharmaceutical Society;
Author of "Chemistry: General, Medical, and Pharmaceutical;" London Analyst to the
Associated Fire Offices.

IN ascertaining the temperature to which a specimen of petroleum must be warmed before its vapor can be ignited, different experimenters often obtain different results. The fact is, this "flashing-point" varies according to circumstances. Unless, therefore, two operators work under exactly similar conditions, their reports will not

coincide. In the British Petroleum Act of 1868 somewhat minute directions are given for applying the flashing test to samples of petroleum. As originally drawn up, those directions were supplied to the Government by Mr. Abel, Dr. Letheby, and myself, and related to the testing of the liquid when contained in a three-inch half-filled cup. After they left our hands they were made to apply to petroleum contained in a two-inch full cup, the protection from draughts afforded to the surface of the liquid by the upper part of the half-filled cup being substituted by that of a screen, so placed around the full cup that the efficiency of the original directions should not be affected—that is to say, a sample of petroleum flashing at 100° in the unscreened half-filled cup should flash at 100° in the screened full cup. This should be borne in mind by all persons testing petroleum, as the screen can be so constructed, or so arranged, as to cause flashing-points to be above or below the standard now given. Just before the Act passed I pointed out to the Government that the alteration in the schedule would lead to endless disputes, and was assured by letter (which I still possess) that the construction of the apparatus was only varied in a point of detail to meet an objection, that, in short, the screen was to be so efficiently disposed as not to interfere with the standard previously fixed. I may add that one year later (June, 1868,) in a Bill for consolidating and amending the Petroleum Acts of 1862 and 1863, this standard was maintained with the concurrence of the wholesale and retail petroleum traders, a covered screen (which gives results similar to those obtained in the half-filled cup) being directed to be employed. It is to be hoped that this standard, which has been accepted by all parties interested in the sale of mineral oils, will be rigidly adhered to in any attempt at further legislation respecting these liquids. In a bill now (July, 1871,) before Parliament, the oils are to be tested in a covered cup, and the defining clause describes “petroleum” as being a certain liquid giving off inflammable vapor below 85° (Fahrenheit). It is to be expected that this is the exact equivalent of the foregoing standard—that petroleum flashing at 85° in the closed vessel would flash at 100° in the open vessel. If not, one section or other of oil traders will probably prevent the bill becoming law, a result to be avoided, if possible—for fresh legislation is sorely needed. My opinion as to the occurrence of disputes through the incomplete character of the schedule has been abundantly verified.

The limits of the variations in observed flashing-points, resulting from the faulty nature of the legal “directions” I have, from time to time, ascertained, but refrained from publishing my notes, fearing I

might injuriously influence, or, at least, unsettle, the interests or practices of merchants, makers, or vendors of oils and apparatus. In the face of a new Petroleum Act, however, the notes can only be productive of good.

My own testing apparatus is so constructed as to give results which I believe to be in exact accordance with the intentions of the Legislature. It is similar to what is known in trade as "Miles's" instrument with its 5 in. high screen, but there is no cover to the screen, and the front third of the smoke-holes of the outer casing are permanently closed. The removal of the cover of the screen produces no difference in the flashing-point of a sample of petroleum, the walls of the screen being sufficiently high to protect the cup from draughts in an ordinary room; still, I have operated without it to avoid objections that might be raised against the apparatus in a court of law, no special mention to a cover to the screen being made in the Petroleum Act, 1868. I close up the front smoke-holes (as I have called the holes through which escape the products of combustion of the flame which heats the water-bath) in order to avoid a slight inconstancy of results caused, possibly, by draught from these apertures.

Taking, as a standard, the flashing-point obtained in a three-inch half-filled cup, experiments were made on several samples of mineral oils obtained from retail shops, and thus a comparison established between results with my apparatus and those which, in my opinion, were contemplated by the Legislature when the Act of 1868 was passed.

		Samples.				
		A	B	C	D	E
(1) Flashing-point, in a half-filled cup, &c.,	- - -	106°	87, 88°	96°	118°	88°
(2) Ditto, in Miles's legal apparatus,	- - -	105°	89°	95°	118½°	91°

These results are practically identical; we may, therefore, conclude that Miles's instrument, with the modifications I have described, gives results in accordance not only with the letter, but the spirit, of the Petroleum act, 1868. This is the apparatus I have used in further experimenting with the view of showing what variations of flashing-point are produced by

- A. Time occupied in testing: thirty, twenty and ten minutes.
- B. Difference in the construction of the screen.
- C. More or less blowing or breathing over the surface of the petroleum in the cup.
- D. Position of thermometer (at top or bottom of cup).

E. Presence or absence of rim to cup.

F. Depth of cup (2 in. filled, 3 in. half filled).

G. Partially filled glass cup, closed by a shutter over mouth.

Note.—In operating “according to the act,” I start with the water-bath at about 70° F., take about thirty minutes for the whole experiment, use a 5 inch screen, open at top, and placed on the top of the water-bath (as in How’s or Miles’s apparatus), employ a very thin iron cup (a “tin” one gives the same results), the bulb of the thermometer 1½ inches below the surface of the petroleum, and the testing-flame that of a thin piece of twine. Other conditions are those of the act 1868.

Results are embodied in the accompanying table.

A. Time occupied in testing.—My experience is in accordance with what is shown by the figures—namely, that, as a general rule, oil tested in ten minutes (which is an inconveniently short time) flashes from 2° to 4° lower than when half an hour is occupied. Less time than fifteen or twenty minutes does not allow of proper attention being paid to the operation. The difference of result when twenty or thirty minutes are occupied varies slightly in both directions.

B. The Screen.—A large sheet of pasteboard, simply bent so as to surround the apparatus two-thirds, fixed a few inches away from the instrument, resting on the same table, and extending upward to a height of 6 or 7 inches above the level of the vessels, has never in my hands yielded concordant results. The fact is, that the flame by which the water-bath is heated often creates far more draught than ever exists, or ought to exist, in the vicinity of the apparatus. Hence the screen should, in my opinion, be placed in How’s, Miles’s and other instruments—viz.: on the water-bath, and reaching to height of certainly not less than 5 inches. If the height of the screen is only 2 or 3 inches, it is almost useless. In support of this statement let me point to the table. It will be seen that whenever How’s apparatus was used, the flashing-points taken with a large cardboard screen, with How’s screen, and without any screen at all, were pretty much the same, and 5° to 10° too high in comparison with those obtained with my own apparatus and 5-inch screen.

In connection with the subject of the influence of the screen, it will next be noticed that the addition of a crescent-shaped cover, or even a round cover, to my apparatus, produces little or no effect. The petroleum in the cup of Miles’s instrument is evidently quite protected from the draughts of the lamp below by the height of the screen, and

(in the particular instrument I use) by the closing of the front aperture of the frame.

The addition of a round cover to How's instrument (as scheduled in 1869 Bill), however, makes a great difference, as might have been expected, bringing down the flashing-point some 10°—bringing it down, in short, to what it ought to be under the Act.

The directions appended to the Petroleum Bill of 1869 were as follows:

“BILL 194.—SCHEDULE.—A. D. 1869.

“*Directions for Applying the Flashing-test to Sample of Petroleum Oil.*

“The cup which is to hold the oil shall be of thin sheet iron; it shall be 2 in. deep and 2 in. wide at the opening, tapering slightly toward the bottom. It shall be supported by means of three brass arms projecting from the edge of the cup, so that it may be on a level with the top of a tin or copper vessel, 4½ in. deep and 4½ in. in diameter. It shall also have a thin wire stretched across the opening, which wire shall be so fixed as to be ¼ in. above the edge of the cup. The thermometer to be used shall have a round bulb about ½ in. in diameter, and is to be graduated upon the scale of Fahrenheit, every 10° occupying not less than ½ in. upon the scale.

“The cup shall be filled with the petroleum to be tested. The outer vessel shall be filled with cold, or nearly cold, water. A flame shall be applied to the bottom of the outer vessel, the size of this flame being such that the water to be heated by it shall rise from the temperature of 70° to that of 90° Fah. in from fifteen to twenty minutes. The thermometer shall be inserted into the oil so that the bulb shall be immersed beneath the surface. A covered screen, with a hole in the cover for the thermometer, shall be placed over the apparatus, so as to surround the apparatus about two-thirds, and to reach several inches above the level of the vessels.

“When heat has been applied to the water until the thermometer has risen to about 90° Fah., a very small flame, from a piece of burning twine, shall be quickly passed across the surface of the oil, on a level with the wire. If no pale blue flicker or flash is produced, the application of the flame is to be repeated for every rise of 2° or 3° in the thermometer. When the flashing-point has been noted, the test shall be repeated with a fresh sample of the oil, using cold, or nearly cold, water as before, withdrawing the source of heat from the outer vessel when the temperature approaches that noted in the first experiment, and applying the flame test at every rise of 2° in the thermometer.

"In performing the test, the operator must be careful not to breathe upon the surface of the oil, so that the vapor produced may not be removed by the current of air."

C. More or less blowing or breathing over the surface of the petroleum in the cup produces a difference of from 2° to 20° in the flashing-point.

D. The position of the bulb of the thermometer.—The thermometer was placed just below the surface of the petroleum, the place where the vapor was being evolved; at the bottom of the cup (the legal position) the liquid was about 2° cooler.

E. Influence of a rim to the cup.—I have already indicated that a half-filled cup and no screen, a filled cup and a five-inch screen, or a filled cup with a three-inch screen and round cover, give similar results.

G. Glass cup.—The glass cup was a cylindrical vessel three inches high and two inches in diameter, having a glass rim outside one inch from the top. The inside measurement was $2\frac{1}{8}$ by $1\frac{3}{4}$. The projecting rim was to support the cup in the water-bath, and to indicate the height to which it was to be filled with petroleum. The top of the cup was plain and flat, and fitted with a metallic cover easily removable. The cover was provided, posteriorly, with a stuffing-box for the insertion of a thermometer, and, anteriorly, with two holes for the application of a flame in taking flashing-points. These holes were closed by a lid, which was raised at the moment of applying a test-flame. This glass cup was used in the usual manner. Flashing-points taken at the mouth of this cup were obtained about 10° , but occasionally a greater, and sometimes a smaller, number than 10° below the standard of the Act of 1868.

I find that the variations of flashing-point caused by variations in the testing apparatus are not equal in extent in different samples of oil. This arises, doubtless, from the fact that the liquid termed petroleum is a mixture in ever-varying proportions of several distinct chemical substances, greatly differing in the readiness with which they give off vapor. Hence, to ascertain the true effect produced on the flashing-point of petroleum by any one modification in the testing apparatus, several distinct samples of oil should be examined, the effect of such modification of apparatus should be tried on three, four, or more, samples before any conclusions are deduced. I append the table to which I have already drawn attention.

OIL WELLS PUMPING BY HEADS.

A CORRESPONDENT asks: "Why do some wells pump by *heads*?" All wells, it may be safely said, flow or pump intermittingly, some more perceptibly than others; yet there are conditions under which an oil well may flow or pump steadily; but these are few indeed.

Every practical and observant producer will inform us that wells act intermittingly under the following conditions: Imperfect thimbles or burst tubing; a deficiency in the standing valve, such as "*working*" in its seat; shrunken leathers, or by the working valve *seat* becoming imperfect; balls creased or in any other way imperfect, or cups worn. In the case of such derangements as we have enumerated in relation to the lower or standing valve, a well must pump by heads, as under such circumstances the valve cannot hold the oil; it must, therefore, accumulate till it reaches the working valve.

In like manner may we account for a like result in the case of the working valve when in a defective condition. With defective thimbles and burst tubing the suction is impaired, and frequently a well from the latter cause will cease to produce oil till the defect is repaired.

In Main street, in Rouseville, is the site of an old well, drilled some nine years ago, which was pumped and long since abandoned; it is now covered over with earth and hidden from view. This well, with the regularity of time, flows oil and gas once a month. The cause is obvious, as evidently the gas accumulates, carrying with it oil, forcing itself through the resisting earth.

Professor Winchell, in his article on "Something About Oil,"* writing of intermittent wells, says that they appear to act, in some cases, precisely after the manner of intermittent springs, and that the combined action of gas and oil produces the phenomenon. Our author supposes the case of a stream of gas struck over one hundred feet from the surface of the rock, and a small stream of oil twenty feet below the gas. The entrance of the oil fills twenty feet of the hole, and begins to submerge the fissure at which the gas is escaping. The gas forces its way through the oil with a sputtering sound, bubble after bubble rising to the surface, making louder and louder complaints, till, finally, summoning all its accumulated energies, it hoists the superincumbent column of oil to the surface, and pours it out in a few seconds' duration. The flow then ceases, and the same operation begins to be repeated.

*See this Journal, No. 4, p. 123.

The same results would ensue if oil and gas found entrance at the same fissure, or even if gas were admitted at any distance beneath the entrance of a small supply of oil.

The only conditions under which a well can pump steadily is, when the supply of oil is of such volume as to fill up the hole continuously to the lower or standing valve, thimbles, tubing and valves being in perfect order.

DANGEROUS BURNING FLUID.

THERE is no fluid, says a writer in the *Indiana Journal of Medicine*, used for furnishing light that will "*explode*." The naphthas sold by dealers and travelers through the country, under a variety of names, "oils," "fluids," "gasolines," etc., etc., will not explode like gunpowder, gun-cotton, nitro-glycerine, etc. It must be distinctly understood that it is only the vapor which rises from the surface of the liquids, mixed with air, which suddenly explodes. A lamp or can holding these dangerous volatile fluids cannot explode if it is full, or nearly so, as there must be a space above the fluid filled with the vapor mixed with air, in order that any detonation may occur. The men who vend naphtha under assumed names deceive purchasers by setting naphtha on fire, and by turning it out and handling it in a way which seems very dangerous to uninformed bystanders. They say to their victims, "See, this oil won't explode: I put flame into the lamp, into the can, turn it out upon the floor, burn it under all possible conditions, and it don't explode; can anything be safer than this?" This kind of experimenting is unfortunately deemed satisfactory by many, and they readily introduce the dreadful combustible into their families.

Three-fourths of all the accidents reported as lamp explosions are not explosions; they are horrible burnings from the simple ignition of the fluid by the spilling of the same upon the clothing, or by the breaking or upsetting of lamps. These naphtha fluids are not so dangerous from the liability of the vapor to explode, as from the inflammability of the liquids themselves. Now, remember this. The loss of life, and the loss to insurance companies from the burning of buildings, is due much oftener to the ignition of the fluid than to explosions; occasionally a genuine lamp explosion occurs, but not often, for it is difficult to have in a lamp or can just the right mixture of air and vapor. Equal

parts of air and vapor will not explode; three parts of air and one of vapor give a vigorous puff when ignited in a vessel; five parts of air to one of vapor give a tolerably smart report; but to attain the highest amount of force, about eight or nine parts of air with one of vapor are required. Now, as an experiment, it requires considerable skill and experience to get up a perfect explosion with naphtha vapor or with gasoline. We once experimented with a fluid taken from a can, the vapor of which had exploded in a lamp, killing a woman, and it required several hours before we could manipulate so as to obtain powerful detonations with the air-mixed vapor.

We should know that any liquid which will burn readily at ordinary temperature is *unsafe*. *Nothing can be added to gasoline or naphtha which will render it safe, or the vapor inexplusive*. The traveling quacks do not add anything to their liquids but cheap insoluble substances, and this they do to keep up the deception. The dangerous volatile liquids cannot be "carbonized," "ozonized," or "oxygenized," and to claim to do this is low, vulgar quackery. When any one comes before officers and insurance companies, dealers or consumers, claiming that they have an "inexplusive oil," which is "perfectly safe," etc., and challenging a trial, let them turn a little of the fluid into a cup or saucer, and if it takes fire when touched with a match, *it certainly will afford explosive vapors, and is a dangerous agent*. After making this simple trial, as a matter of justice, call the porter or a servant, and order him to tumble the rascal into the street, or what would be better, make an arrest and have him tried as a dangerous mountebank, and a conspirator against life in the community. There is not a jury in the country but would send such an impostor to the State prison.

More than *two thousand* persons were killed or dreadfully burned last year in the United States from the use of these liquids, and this loss of life was wholly unnecessary. It resulted from the recklessness and cupidity of men who ought not to be outside of prison walls. There should be no timidity or hesitating in dealing with this class of persons. An end can be put to the business in a few months, if the people will it.

PETROLEUM AND PETROLEUM SPIRIT.

OUR attention has been directed to several letters which have lately appeared in the daily press, calling attention to the distinction between the ordinary petroleum oil of commerce and petroleum spirit, both of which are of great commercial importance. The writers of the

letters to which we refer appear to hold the opinion that legislation with regard to petroleum should be confined to the more volatile product, petroleum spirit, and that any restrictions with regard to the oil are altogether unnecessary. But in giving circulation to such a proposition as this, the fact is overlooked—we do not say intentionally—that it would still be necessary to define the precise point at which spirit should cease to be regarded as such, and at what point the liquid in question should be classified as oil. Those practically acquainted with the subject are well aware that both the specific gravities and the igniting-points of oils, generally so-called, have a tolerably wide range, and we do not see how, by the simple classification of oils and spirits, we should be much nearer the end of petroleum disputes. Our legislators have, we consider, most properly fixed a point below which all oils are to be regarded as dangerous, and above which they provide for no legislative interference. And though we should have preferred to have seen the point thus fixed, say 10° higher than it has been, we are persuaded of this, that an honest compliance with the past intentions of our Legislature upon this subject would have rendered any further restrictions useless.

But as the mode of testing, prescribed by the Act of 1868, left far too much scope to the inclinations of the operator, and as this has given rise to a great deal of unnecessary and vexatious litigation, the time has arrived when it has become imperative, not that existing restrictions, however unsatisfactory, should be removed, but that they should be more strictly defined. That petroleum can be made safe enough for all practical purposes, as a source of light, without damaging in any way its light-giving properties, has been pointed out often enough in the pages of this journal, and we only refer to it now seeing that an attempt is being made to hoodwink our legislators, and also dealers in this article, into the belief that if you make it safe it will not burn with any degree of satisfaction. This statement is as absurd as it is positively untrue, and, like many others of the same class, must evidently proceed from some deeply-interested source. With regard to petroleum spirit, the public purchase it in the full knowledge that they are buying an unsafe and dangerous article; and hence, if we are to judge from the few accidents that have come before us caused by petroleum spirit, we should say that it must be generally handled with considerable caution and care. With petroleum oil, or oil sold as such, the case is totally different.

Petroleum oil is bought by the unsuspecting consumer under the idea that he is purchasing an article from which there is, comparatively,

no danger. Now, the statistics which we have published from time to time have shown us that the public are not always supplied with what they purchase, and that with regard to oils sold in the metropolitan district, for instance, it has been over and over again stated upon undoubted authority that some 50 per cent. of them are below the standard required by the Petroleum Act. We place alongside these remarks a statement which appears in the *Daily News* of the 29th ult., and signed by M. Bevington Redwood, F.C.S., Secretary and Consulting Chemist to the Petroleum Association: "The oil imported from America, and sold in the shops as petroleum, is tested by this Association on being landed and before being tendered, and such parcels as are above the standard fixed by the Acts of Parliament are certified as merchantable; the public in this way being secured against unwittingly becoming the purchasers of inferior oil."

We do not pretend to know what, if anything, takes place with the oils so certified, after they have passed the Association in question; but this we do know, and it may be worth the notice of some of our readers to make a memorandum of the fact, that the tests of this Association do not harmonize with the tests of inspectors generally, with those of the trade who are best posted up in such matters, or with several chemists of eminence whom we could name; and that hitherto their value has not been sufficiently recognized to protect the unfortunate holders of certificates from prosecution and conviction. With all due deference, therefore, we think that the public are entitled to more protection than they could hope for at the hands of this Association, and we trust our legislators will do their duty without being swayed by the interest of any particular section of the trade, or of being persuaded into the belief of statements without due inquiry as to facts.—*London Oil Trade Review.*

ABOUT TESTING LUBRICATING OILS.

SOME practical and inexpensive method of testing the quality and relative value of different kinds of lubricating oils is a standing want on the part of large oil consumers. This is especially true in the case of railway corporations, where the large consumption and the severe test to which lubricators are subjected in operating their roads, make a question of quality and cost a matter of grave consideration. Heretofore the selection of the lubricators has been very much a matter of guess work. The manufacturer or dealer importunes the pur-

chasing agent to give his goods at least a trial. He has no means of doing so except to put the oil on his trains, and take the chances. If he concludes to take the risk, the oil may prove to be inferior, or, if it proves good, it may have been sold so low that the order cannot be duplicated, and a second invoice may result in damage to machinery, with loss of time, patience and money, and possibly loss of life.

We know that some of our best railway managers comprehend the importance of this matter, and are anxious that some method should be devised which will secure them against the contingencies we have indicated. The Great Western railway company of Canada is the only one, so far as we are aware, that has undertaken a practical solution of the question. At their machine shop, in the city of Hamilton, they have erected a very simple yet thoroughly practical machine for the purpose of testing lubricating oils. It consists of an ordinary car axle arranged to run in ordinary journal boxes. The axle is run by belts from a stationary engine, at a uniform rate of speed, and under a pressure of $2\frac{1}{2}$ tons to each journal—equivalent to ten tons to a car. The packing and all the other conditions of the test are made to correspond as nearly as possible to those of a car in motion on the road. A thermometer is so arranged as to indicate the exact temperature, and during a trial all the conditions of the test are recorded in what is called the test book. No oils are purchased nor allowed to be put on the road without being first tested by this machine.

It may not be inappropriate to give in this connection a brief description of a machine for a similar purpose, but of more elaborate construction, built a few years ago by the authorities at the Brooklyn Navy Yard. In this case the tests were designed to be analogous to the requirements for the main bearings of screw steamers. For this purpose, a shaft with journals 9 inches in diameter were fitted to revolve in appropriate brasses. The upper brasses, instead of being secured by the usual caps, were weighted by a system of levers so arranged that the pressure could be graduated at pleasure and accurately measured. By running at a uniform rate of speed, with a counter attached to each shaft and a thermometer in each one of the upper brasses, they were able to keep an exact record of all the conditions of the tests. In operating the machine, the pressure on the journals was gradually increased until the maximum that could be sustained without increasing the temperature above 116° Fahrenheit was ascertained. This maximum pressure, other conditions being equal, was taken as an index of the relative merits of the oils tested.

It was found, by applying Winter Sperm Oil at the rate of one half gallon in 25 hours, the journals would just stand a pressure of 9,400 pounds without increasing the temperature. Under the same conditions Summer Sperm was reported as standing a pressure of 11,164 pounds, and lard 8,000. The best grades of petroleum lubricators stood from 8,000 to 9,000, while the various inferior mixtures and compounds were represented by greatly reduced figures. It appears that the operators conducted all their experiments with a uniform quantity of oil and a graduated pressure. We think they would have rendered their

report far more valuable if they had varied the test, and added a table of results in running with a uniform pressure, and the quantity of oil graduated to the apparent requirements of the journals.

A purchasing agent, with a machine of this kind adapted to this use, would be able not only to guard against annoyance and damage from inferior goods, but would be able to determine, with far greater accuracy than at present, the relative value of the different grades of lubricators in the market. He could go to work intelligently to find the true economic mean between high and low priced oils, and could determine for himself the quality and cost of oil adapted to his use. The Brooklyn Machine complete cost but \$412. We presume that one possessing all its advantages, and adapted to railway purposes, might be constructed for nearly or quite one-half the money. But in our opinion they would be cheap at double or three times that sum, provided they could be obtained for no less. Will not some one, possessed with a spirit of invention, go to work and construct and put on the market a portable machine which will meet all the requirements of the case?—*National Oil Journal*.

LIABILITY OF INSURANCE COMPANIES TO OIL REFINERS.

THE following curious point of law is now under litigation between an Oil Refining Company and a Fire Insurance Company, the decision of which will be of importance to the entire refining interest. It appears that:

“The policy of insurance covering the distillate tank was taken out on the capacity of the tank, and as such it necessarily included any quantity of oil that might run into it from the crude oil still and be therein burned during the progress of the fire until the capacity of the tank had been filled, after which any oil consumed by the fire became a dead loss to the owner. This position seems so clear as to be beyond the possibility of dispute, and yet the insurance company in question is not willing to concede the refiners’ claim in the matter. When the fire broke out there was comparatively little oil in the distillate tank, and what was there was deemed to be not in any great danger. The fire occurred under a crude oil still; and the crude oil that ran down upon the furnace so augmented the heat from the coal fire as to make the still work with extraordinary force, and to run refined oil in the distillate tank in a very large volume.

“So long as the distillate tank did not ignite, this fact was the cause of saving a large quantity of refined oil, but immediately the latter did ignite it became the cause of additional loss to the responsible party, for the reason that the refined is worth more than crude oil. Finally, despite all exertions to save it, the distillate tank did ignite; and the fire in and around it was so furious as to render it impossible for any

one to turn the stop that let the refined oil from the still into the tank where it was consumed. In consequence of burning and overflowing, more refined oil was lost in and through the distillate tank than it could contain. On account of the difficulty of determining exactly how much refined oil there was in the distillate tank, the owners thereof, although positive that they lost through the burning of this tank more oil than it would hold (in consequence of combined burning and overflowing), are willing to settle their claim for loss by fire in the distillate tank on a basis that allows less oil than that which would fill the capacity of the tank to have been destroyed. This basis the insurance company refuses to accept, and the case is still the subject of dispute."

SAND PUMPINGS.

Petroleum Springs in Italy.—From time immemorial (says *L'Industriale de Milano*) the inhabitants of Rivanazzano, a small place a short distance from the town of Voghera in the former kingdom of Sardinia, have been in the habit of using mechanically a certain fluid which issues in small rills from the Madonna del Monte, as well as of burning it as a light in their dwellings. At the top of this mountain there are traces of an extinct volcano, and some short time since wells were sunk at its foot, and their contents subjected to chemical analysis, the result of which was that petroleum of an excellent quality was found to be present in considerable quantities. The explorers then came to the conclusion that abundant subterranean reservoirs of this mineral oil must necessarily exist at no great distance from the scene of their operations, and they determined to trace the above mentioned rills to their sources.

Excavations were accordingly commenced on the borders of the pleasant slopes of Nazzano, about twelve kilometres from Voghera. At a depth of about fifteen metres a considerable issue of gas took place, and when thirty metres had been reached, salt-water strongly impregnated with petroleum was met with, a circumstance which the explorers remembered as always occur-

ing in the oil springs of America. Following up the excavations, loud explosions of gas took place at a depth of ninety metres, and large volumes of salt water mixed with petroleum issued from a stratum of sandstone rock which was there met with. Pumps, on the principle of those used in America, under similar circumstances, were then introduced, and an abundant supply of petroleum obtained. Ultimately, a concession of this valuable property was granted by the Italian government to the explorers, as a reward for their exertions.

The petroleum thus obtained has now been refined, and found to yield a valuable lubricating oil, and one well adapted for mixing up paint and varnishes, while the oil for burning gives a very brilliant white light, and has been found remarkably free from the offensive odors usually existing in mineral oils. Our contemporary adds that the results of these explorations have created quite a sensation, and that it is to be hoped that capital will not be wanting fully to develop discoveries which have been pronounced by eminent engineers, geologists and chemists, to be most promising in a commercial, as well as important in a national point of view.

Effect on the Trade of the New York Kerosene Law.—Since the law

was passed, some weeks ago, prohibiting the use within the city limits of kerosene oil of a lower degree than 100 deg. fire test, or 100 deg. "flash" test, the applications by retail dealers for license to sell it have increased more than 1,000. License will, of course, be given to all of them. The effect of the new law on the manufacturing interest of petroleum has been to set a majority of our refineries to work to make kerosene oil of the high test required by the new law. As the total capacity of New York for producing refined oil exceeds 25,000 barrels per week, and as our city consumption of kerosene is not 2,000 barrels per week, it will be easily seen that the manufacture of the high-test oil now legally required for local consumption is being enormously overdone. The result to the manufacturing interest of this over production of high test is beginning to be felt adversely, and will shortly—if adhered to—be found very depressing.

When the law was passed, many of our refiners took to the manufacture of kerosene at 130 degrees test, in the belief that they could realize from two to four cents per gallon above the margin, on making the ordinary oil of 110 degrees test. The result of their commercial alacrity has already been to bring bids for their product at a price absolutely lower than the cost of making oil at 130 degrees test. The only market except that of New York which requires kerosene as nearly non-explosive as ours are those of the British dominions. The British markets are now very full of petroleum, and the large surplus of high-test oil now in our market can not at present be sold for British consumption at a profit. According to the judgment of some of our ablest refiners, the moral of the present state of the high-test oil market is that no more high-test oil should be made until the stock now on hand and that in process of manufacture shall have been largely diminished.—*N. Y. Bulletin.*

Petroleum Prospects.—The Oil City Register thus discusses the prospects of oil production: New wells have been so numerous during the last few weeks that their announcement is becoming monotonous; and, strange to relate, the announcement of a hundred barrel well

every few days has not as yet permanently affected market rates. Throughout the season, so far, prices have been better maintained than we have ever known. The daily production, taking last month's petroleum report as a basis, is liable to be increased during the present month, but not, we think, to any alarming extent.

The amount of development required to make any increase above the general average, is greater than the general reader would imagine. The number of wells now producing the present supply is about 3,200. The average life of a well, or the length of time it continues its largest production, is seldom over two months, and more generally that many weeks, and not unfrequently a few days. From the time the well has reached its greatest production, the decline or decrease of the same is rapid and certain. When the well has reached its lowest stage, torpedoes are applied, and a reasonable per cent. of such wells may be increased by this means. When this cannot be done wells are either abandoned or pumped one or more times each day. From this explanation it will be seen that a slight decrease on the part of the 3,200 wells in operation, will absorb a good many hundred-barrel wells. And to keep up an average production also requires the drilling or commencement of some three hundred new wells each month. Of these only a portion prove producing ones. Although large oil fields are constantly being opened up by the extensive development, the chances of a production large enough to glut or overwhelm the market, are each year growing far less. Men of capital have for several years been engaged in buying up all the territory giving promise of being productive. These tracts, when developed by a good well, are not leased, as in former days, and the surface pepper-boxed by a myriad of wells. The owners refuse to lease, and develop their own lands, which is, of course, a slower process, and less liable to throw a large supply on the market when the demand will not justify. The fact that the production can be increased so as to be ample for any remunerative demand, will do more to give permanence to our general business than anything else. The operators of the hills and valleys of

Venango and adjoining counties have the precious article on draught. The civilized world are as insatiate in their demands as Oliver Twist appeared to the virtuous Mr. Bumble, and are continually asking for more, and we can supply them as long as they can pay for it.

Duty on Petroleum in Italy.—Some correspondence has taken place between the Secretary of the Treasury at Washington and the American Minister in Italy, in relation to the increase of duty on petroleum imported into Italy. At the time of the negotiation of the treaty between France and Italy, solid asphaltum and mineral tar, and perhaps other fluid and semi-fluid bituminous products, were imported into Italy and France in inconsiderable quantities, while the substance known in the language of commerce as petroleum had not yet found its way into general use, and was scarcely recognized as an article of international traffic. The word used by the regulations of the treaty was bitume, and when the trade in petroleum sprung up, the importers contended that bitume, as a generic term, embraced all bituminous substances, whether solid or fluid, including, of course, petroleum. The first importation of petroleum, in any considerable quantities, were from France, and the influence of the French Government secured a construction of the treaty by which petroleum was assimilated to the bituminous. While the increase of duty is not regarded as strictly a retaliatory measure, the Minister thinks there is no doubt that the dissatisfaction of the Italian dealers in marble with our high duties on that product has tended to promote the passage of the bill. The Italian Minister of Finance has suggested that the duty of five francs per hundred kilograms on crude petroleum, while the increase on the refined article is only three, will operate favorably to American industry by promoting the refinement of that product at home.

Production of the Lubricating District.—Below we give the daily production of the wells yielding heavy oil in this city (Franklin) and vicinity. The territory embraced in this report lies between Patchell and Two-Mile Runs:

PATCHELL RUN.	
R. D. White & Co., on Pearson Oil Co.'s land,	1 bbl.
One well drilling.	
Richard Thomas, well on Franklin Co.'s land,	25 bbls.
M. Goss & Co., same property, No. 1,	5 bbls.
M. Goss & Co., same property, No. 2,	10 bbls.
M. Goss & Co., same property, No. 3, drilling for 3d sand.	
DR. FEE FARM.	
Fee, Piaget & Co.,	10 bbls.
M'CALMONT FARM.	
Parker & Spencer,	12 bbls.
J. Powley, No. 1,	25 bbls.
" " 2,	8 bbls.
Mathey & Son, No. 1,	4 bbls.
" " 2,	8 bbls.
Newell Brothers, No. 1,	1½ bbls.
" " 2,	9 bbls.
LAMBKTON FARM.	
Geo. H. Blinberry & Co.,	4 bbls.
Humphreys & Co., No. 1,	1½ bbls.
" " 2,	1½ bbls.
" " 3,	1 bbl.
" " 4,	1½ bbls.
Col. Fawcett,	1 bbl.
Thomas Mahan,	2 bbls.
SMITH FARM.	
Geo. P. Smith, 5 wells,	35 bbls.
POINT AND CITY.	
P. H. Watson lot, 5 wells,	12 bbls.
Martin & Epley lot,	5½ bbls.
W. M. Epley lot,	4 bbls.
P. Haines lot,	7½ bbls.
Egbert & Bleakley property, total,	70 bbls.
Egbert & Dewoody property, total,	10 bbls.
Wm. Brough & Co., Mill lot,	4 bbls.
Capt. Hull,	¾ bbl.
Forbes & Co.,	¾ bbl.
D. B. Irwin,	¾ bbls.
James Evans lot,	2 bbls.
Mumford & Co.,	½ bbl.

TWO MILE RUN.
 John Kunkle farm, 3 bbls.
 Kelly farm—Snow and others, 6 bbls.
 The total daily production of the district in 295 barrels. There are a number of new rigs being put up.—*Spectator*.

Where Petroleum Goes.—It is singular to note the great variety of destination of which the refined petroleum manufactured in London and Petrolia is sent. Manifests exhibit it going to

Gibraltar and Malta; to Hamburg and St. Petersburg; to Trieste and Odessa; to Beyrout, Genoa, Cronstadt, Stockholm, Elsinore, and Antwerp, to say nothing of the West Indies and Australia and Brazil, where the consumption is growing rapidly. There has been no circumstance tending so much to the recent growth of London as the petroleum business, and now that any danger as to want of permanency has been removed, and Canada oil is in call in New York and Liverpool, it is not unlikely that additional capital will be thrown into the business, of which, indeed, the erection of large works at Sarnia on the part of an English company is the most recent example.—*London Free Press*.

On Cherrystone Run, in some localities, the owners of small wells have gone back to the primitive mode of pumping them, viz.: by horse power. This is being done where the wells only yield from one to three barrels per day, and are pumped "by heads." The saving in labor and fuel is considerable, as one man and a team of horses can pump five or six wells in the course of a few hours.

To destroy burdocks and other troublesome plants, the *Rural New Yorker* says: Cut close to the ground with a sharp hoe, and apply a few drops of kerosene. The plants so treated will never "put in an appearance" again.

Clarion County Oil Wells.—A correspondent says: On Monday last, in company with Mr. A. Dickey, we paid a visit to the Nowlan & Panton farm, about one mile north-east of Foxton Station. We found Mr. Panton drilling away at the well on that farm. He claimed to have reached the third sand, and the gas was roaring at the mouth of the conductor hole like a small volcano. Not only was the gas escaping from the well, but it was heaving up a constant mist of oil, and Mr. Panton was as thoroughly soaked with the fluid as if he had been taken from an oil tank. Pipes were attached to the top of the hole and a considerable quantity of oil was constantly being blown from the well into a tank erected for its reception. In order to prevent the gas from taking fire, the boiler has been set some

two hundred yards from the well, and steam is conveyed to the engine in pipes. This well is certainly unsurpassed as a gas well by any in the oil regions; and it will no doubt, when completed, yield a bountiful supply of oil. This is the well mentioned by us several weeks since under the head of a "Singular Freak of Nature." Mr. Jas. Nowlan, one of the owners, is an old resident of Petroleum Centre.

Armstrong Oil Field.—A correspondent of the *Jamestown Journal* writes as follows in regard to the Armstrong Run oil field: The Armstrong oil field is eight miles below that of Parker's, on an air line, and is in range with it south-westerly, and with all the best producing oil territory extending north-easterly five degrees north through the State, and is the south-western limit in which oil has been discovered in paying quantities in the State, the north-eastern being Tidioute, in Warren county. These two points are one hundred miles apart, by rail, and the extent of country between them has probably, within the past ten years, contributed a greater impetus to financial activity than any mineral territory of the same area in the world. The amount of oil produced in the Armstrong territory was estimated on the first of June to be about 5,000 barrels per month, and is of an excellent quality. The great depth of the oil-bearing rock at this point has had a great tendency to retard development, and for a long time to keep out operators of a limited capital. The third sand is found at the depth of from 1,200 to 1,350 feet, and the cost of reaching it is from \$7,000 to \$8,000. But the oleaginous fluid is a magnet of such superior attraction that old mother earth is forced to give up the treasure wherever it is once found to exist. Like the mania for gambling, those who have been fortunate, with few exceptions, are willing to engage in anything else.

A Valuable Invention—Important to Producers.—The *Titusville Herald* says: We were yesterday shown the model of a new sand pump reel invented by J. A. Fleming, of Shamburg, which is intended to supersede the old friction wheel system of withdrawing the sand pumps from wells. The model consists

of a small upright cylinder engine of ordinary construction, the piston rod of which is connected with a horizontal shaft by means of a crank. Directly on a line with this shaft is the reel shaft proper, upon which the sand pump rope is wound. It is supported by two uprights and the requisite bearings, and these two shafts are connected together or thrown out of gear by means of a clutch joint and hand lever. The principal object of this arrangement is that a well which is pumped by "heads" can be exhausted as often as required without the use of the other machinery connected with the well, except the casing which excludes the water, and a large sand pump capable of holding a third of a barrel. The economy of such an arrangement must be self-evident to the owners of small wells. The same apparatus can be used for sand pumping while drilling with much greater facility and economy than by the ordinary methods. Mr. Fleming is well-known throughout the region as the inventor of the sucker rod, swivel and wrench which bears his name. He is also an old and experienced driller and a thoroughly practical mechanic. He proposes to place his new steam sand pump in market within two weeks, and it will doubtless create quite a revolution in the economical pumping and management of small wells. The working model was manufactured at the Titusville Industrial Works.

Discovery of Petroleum in Ireland.

—We take the following from an English paper: The industrial and commercial progress of the sister island has ever been much impeded through the comparative absence of fuel adapted for the generation of steam, for although peat exists in abundance, its bulkiness has precluded its use as a steam fuel, except in the immediate vicinity of the bogs. A discovery, however, is now reported, which, if proved to be of the vast importance at present attached to it, will bring about an important change in Irish industry. It appears that at Clones, in county Monahan, a petroleum deposit has just been opened upon, offering indications quite as favorable as those which led to the development of the enormous oleaginous wealth of Pennsylvania. Sufficient

time has not yet elapsed for the value of the spring to be ascertained, but the results of further researches are looked forward to with the greatest interest.

The Oldest Producing Well in the Oil Region.—While passing through Rouseville yesterday, our attention was directed to the Gould & Stowell well, a short distance south of the railroad track, on the Buchanan farm. This well was put down in the fall of 1859 by Messrs. Rouse & Mitchell, the pioneer operators on the Buchanan farm. It was sunk only to the first sand, and was pumped for several months at the rate of eight barrels per day, when it was sold to Mr. Potter, who went down to the third sand and obtained a production of three hundred barrels per day. This production was sustained for several months, when it again declined, and the well occasionally changed ownership, till in 1865 it passed through the hands of the Sheriff into possession of the First National Oil Company, and was disposed of by them to Gould & Stowell. For several months past it has sustained a production of from four to five barrels per day. It is unquestionably the oldest producing well in the region, and dates back to the earliest period of the oil operations following the success of Colonel Drake. It would be interesting to know the actual statistics of its production, but it is doubtful if any satisfactory record has been preserved.

Lamp Wicks.—A correspondent of the *Scientific American* says: Allow me to give your numerous readers the benefit of my experience with long wicks. I cram all the wick that I possibly can into the lamp, fill up the interstices with sponge, and saturate the whole thoroughly with kerosene. I have always found the supply sufficient for the longest winter's night; as long as any oil remains in the wick, the lamp keeps burning. I have had this fairly tested. One of my little ones—a two year old—contrived to upset a small table supporting a lamp. With the exception of breaking the glass, no further damage was done, not even soiling the carpet. In fact, my plan was brought about from a similar accident, and a narrow escape from serious damage. As the wick burns away I keep filling

up with sponge, and I think I have the nearest approach to a safety lamp.

I have heard that there is an asbestos non-inflammable lamp wick in the market, but as the vender of it does not appear to advertise in your columns, and as I, in common with many other mechanics, take no other paper, I am in ignorance where to get them.

Licenses to sell Kerosene.—The extent of the retail business in petroleum may be judged from the fact that there has been found in New York city twenty-three dealers in the article. The competition is so great, that adulteration with benzine renders some of their fluids utterly dangerous and worthless. Nearly one-tenth of all the fires in New York during the past year are attributed to the use of these lightning compounds. In future all dealers in kerosene will be licensed by the Commissioners of the Fire Department. The new law goes into effect on and after July 1st. This is a good move, as it is to the interest of the fire insurance companies to secure a controlling voice in their appointment. It remains to be seen how far it will remedy the evil.

Bituminous Shale Gas.—At Denver, Colorado, five hundred feet of illuminating gas was made in half an hour from bituminous shale, which is said to abound in that locality. The gas was manufactured upon the same principle as ordinary coal gas, by placing the shale in a retort, and heating to redness.

A Burning Well.—The *Pittsburg Gazette*, says: An oil well near Leechburg, on the Western Pennsylvania railroad, took fire Saturday morning, producing great excitement in the neighborhood. The well was being drilled for oil and had reached the depth of 1,200 feet. On the 4th inst. a vein of water was struck, and the column was forced fully one hundred feet above the top of the derrick. The water and gas flowed uninterruptedly ever since that time. Saturday morning the gas ignited, and the flames shot up to a height of seventy-five feet. Steps were taken immediately to smother the fire, but at last accounts they were unavailing.

Income Tax on Oil in Tanks.—The decision of the Commissioner of Internal Revenue some time since, holding that all oil held in tank was subject to tax under the provisions of the income tax law, has, under a more full examination of the case in all its bearings, been reversed. Mr. James S. McCray, of this place, carried up the case at no little private expense, and is entitled to the thanks of the oil producers of the entire region. It is not fair, however, that he should bear the whole cost and burden, as all holders of petroleum in tank share with him the benefit.—*Petroleum Centre Record*.

Oil Trees.—They have in China what is known as the grease trees. Large forests grow there, and the oleaginous product has become an article of traffic. The grease forms an excellent tallow, burning with a clear, brilliant, and, what is more to the purpose, white light, and at the same time emitting not a trace of any unpleasant odor, or the ordinary disagreeable accompaniment of combustion—smoke.

Oil in Indiana.—A company, composed of twelve citizens, have been boring for oil in Terre Haute, Ind., for several months past. The first well was a failure. The second well struck oil on the 5th at a depth of 1,636 feet. The tubing was put in next day, and a pump has been in operation, but the water has not yet been exhausted. Fifteen or twenty barrels of oil have already been pumped up, and it is the opinion of experienced oil men from Pennsylvania that this will prove to be at least a thirty barrel well. The oil is of the best quality, such as experts call lubricating oil.

The East Sandy Oil District.—The *Petroleum Centre Record* says: There are at present ten new wells going down at East Sandy—nine of which are drilling and the other one nearly ready. Two of these wells will be completed inside of two weeks. There are now six pumping wells in the East Sandy Oil District, averaging from fifteen to fifty barrels daily. The new well, struck yesterday, is yielding fully fifty barrels per day. The gas still continues to flow from the old burning well with undiminished force. Pipes have

been laid from this well to all the wells in the neighborhood—about twenty—and they are all run by gas. With this large amount utilized, it is estimated that enough to run fifty additional wells is allowed to go to waste. From twelve to twenty new wells are projected, the

necessary lumber for derricks, etc., being already on the ground in many cases. The prospects of the operators in the East Sandy Oil District are very flattering, there being no doubt about the striking of oil in every well put down.

EDITORIAL NOTES AND REVIEWS.

The English Petroleum Bill.—A bill has been introduced in the British Parliament relating to the sale, gravity, harbor and shipment regulations of petroleum. On its introduction in the House of Lords by the Earl of Morley, the oil interests of London became somewhat excited, and many attributed the bill to certain Scotch members of Parliament, who are interested in *coal oil* refining, and that their aim was to insure the destruction of the petroleum trade. This surmise has not been sustained by any show of reason. The bill, we have no doubt, is well meant, the promoters desiring to protect the public in regard to quality, storage, &c., of petroleum. We are convinced that any really objectionable provisions which the bill may contain will be expunged when the trade point out any such. The bill is optional with the local authorities. This in itself is an argument that no harm can be done. We hold that proper legislation in regard to petroleum will strengthen

and extend the trade in our great staple in the British Isles. We would refer to a late circular issued by a firm of brokers who have paid much attention to mineral oil products. Messrs. Mordaunt Bros., of London, remark that "the new petroleum bill, just read a second time in the House of Lords, amongst other clauses of great stringency, adopts the system of the 'close test' in lieu of the 'open test,' and allowing a difference of 15° of temperature, fixes the firing point at 85°. Some think that this is not enough, and that it is tantamount to raising the test to 120°; but we are inclined to believe that the allowance of 15° will about equalize the two systems of test, whilst the proposed new method of testing is far superior to that now adopted, giving more reliable and satisfactory results. Either way there is no reason for alarm that the act will be prohibitory to the use of petroleum, as we have now on sale United States petroleum, water-white, and standing a test of 120°, of the finest burning quality."

Correspondence.—W. S., writing from Petrolia, Canada, asks: "Is oil found in Peru, and in what countries in Europe?" We believe oil is found in Peru, but do not know that it is found in paying quantities. Oil is found in the following European countries, in all of which oil mining is a paying branch of industry: *Hanover, Austria, Italy and Southern Russia.*

We are frequently recording the discovery of oil in almost every land under the sun, many of which reports get into the newspapers on very slight *show* of evidence.

Reading the Exchanges.—(*Continued.*)—There is a volcano in West Virginia with a weekly irruption. This is called the "*Lubricator*," and is the organ of the lubricating oil trade of West Virginia. A spicy, well-conducted sheet, and, evidently, well patronized. The editors are new in the business, and forget sometimes to give proper credit to other journals. Terms, \$2.00 per year; Sargeant & Bowen, Volcano, W. Va.

The *Weekly Times*, Parkersburg, West Virginia, is a good paper, and represents the oil business of that immediate neighborhood, as well as taking an active part in politics. The editor seems to have bred an idea that he will meet his final end at the hands of some *con-vent-ion* or other. He is perfectly sane, however, in other things, and issues a good paper.

\$2.00 per year: address the *Weekly Times* Publishing Company, Parkersburg, West Virginia.

The *North-western Independent* records the petroleum developments at Parker's Landing—a first-class weekly paper, with evidence of fine taste in selections and master energy in compiling local events. The Parkersburg oil district is threatening to out-shine Oil creek itself. The *Independent* is published by Clark Wilson, Esq. Terms, \$2.00 per annum.

The *East Brady Independent* is another independent publication of weekly appearance, and, like those mentioned above, somewhat oleaginous in its nature, it being sufficiently near the *Armstrong* oil fields to reap harvests of news from that really good territory. The editor, Col. Sam Young, is one combining those very rare and desirable qualities: he can publish a first-rate paper, and better—can make his subscribers settle up.

The *News-Letter and Petroleum Advertiser*: Weekly. Robert McAdams, Petrolia, Ontario. Terms—to United States subscribers, \$2.00 per year, in advance. Gives well detailed reports of the oil productions and trade of Canada. Outside of the United States this is the largest producing territory in the world. Those who wish to keep posted with Canada prospects and development should send for the *News-Letter*.

The National Oil Journal: G. E. Palmer & Co., Pittsburg, Pa. No. 2 of this valuable journal fully justifies our former opinion that if its financial success depends upon its merits, it will be sure to succeed. Having had the pleasure of meeting the Editor, Mr. Van Valkenburgh, we can readily understand that the journal can be no less than a high-toned and eminently useful paper. The subscription price—\$1.00 per year—is so low that no oil man should be without it.

The Forest Republican, as the name implies, is the official organ of the wilderness. We sigh, however, for the gumption of the aborigines, for they, at least, can appreciate an editor's worth. They have nominated for the Assembly Mr. Dunn, the editor of the *Republican*. We wish him joy, and may he be beaten, for so good an editor can illy be spared. Terms—\$2.00 per annum. Address, W. R. Dunn, Tionesta, Pa.

Business Item.—BROWN & STRUTHER'S IRON WORKS AGENCY.—By reference to our advertising pages, it will be seen that Messrs. Brown & Struthers, the well known Founders and Machinists of Warren, Pa., have established an agency at Titusville, where Messrs. K. Brett & Son will conduct their business. The engines, boilers, and general machine work of this firm are so popular among oil men, that the establish-

ment of this agency is certainly a source of gratification as well as great convenience to operators. Capt Brett, long and favorably known in connection with Tift & Sons, of Buffalo, is a gentleman well fitted for extending the business of this popular firm.

TIFFT, SONS & CO., BUFFALO, NEW YORK.—The agency of Geo. W. Tift, Sons & Co., at Titusville has passed into the hands of Messrs. Boughton & Chandler. The number of the engines in use in all parts of the oil regions is sufficient evidence of their merit. The office of Messrs. B. and C. is at No. 9, Chase and Stewart's Block, Titusville, Pa.

JAMES SMITH'S BOSTON IRON WORKS, FRANKLIN, PA.—We would call attention to the advertisement in our pages of this establishment. Mr. Smith is sole manufacturer of the Monahan and Roberts' sand pumps. The sand pump is so important an article of use and trade in oil developments that we shall at an early day give its complete history.

OUR PORTRAIT GALLERY.—We are compelled to go to press and omit a portrait and sketch, which, when they appear, will, we are sure, be received with much satisfaction. The reason for the non-appearance in the present number is sickness of our artist.

The Reports: Markets.—The markets for the month of July, as

a result necessarily consequent upon the season of the year, showed less activity than for several months preceding.

From the eighth to the tenth prices touched their highest figure, when \$4.75 on the upper, and \$4.95 on the lower creek, were bid and taken.

The prices, however, were much better maintained throughout the month than was expected. The continued heavy strikes in all parts of the region had a natural tendency to depreciate prices, and the inactivity of many buyers who were, for the greater part of the time, out of the market, might have resulted without surprising any one, in much greater falling off in the prices. We append a table of highest prices on the Lower and Upper Roads, and the average price for each month of the year :

DATE.	UPPER CREEK.	LOWER CREEK.
July	1 \$4.55	\$4.90
"	3 4.62½	4.90
"	4	
"	5 4.65	4.90
"	6 4.75	5.00
"	7 4.72½	4.95
"	8 4.75	4.90
"	10 4.75	4.95
"	11 4.70	4.95
"	12 4.65	4.92½
"	13 4.60	4.80
"	14 4.57½	4.80
"	15 4.57½	4.75
"	17 4.60	4.85
"	18 4.60	4.80
"	19 4.60	4.80
"	20 4.57½	4.85
"	21 4.60	4.90
"	22 4.65	4.90
"	24 4.57½	4.90
"	25 4.55	4.90
"	26 4.50	4.85
"	27 4.50	4.80
"	28 4.42½	4.75
"	29 4.35	4.70
"	31 4.35	4.70

AVERAGE PRICES.

Average price in January..	U. Creek.	L. Creek.
" " February	\$3.83.5	\$4.03.2
" " March....	4.34.7	4.42.0
" " April.....	4.20.2	4.25.3
" " May.....	3.92.5	3.96.1
" " June.....	4.44.2	4.64.3
" " July.....	4.78.9	5.02.2
	5.57.3	4.80.0

Benzine.—The amount of benzine brought into the oil region during the month was considerable. While we have not the exact figures we do not hesitate to estimate this amount at about 24,000 barrels, and the amount furnished by local refineries at about 10,000 barrels; making 34,000 barrels in all, or an average daily consumption of over 1,000 barrels. This can have no other effect than that of raising the gravity of the oil to a very high degree, and a consequent depreciation of value. We hope, for the good of the trade, that steps will be taken by operators to check this reprehensible usage, and by so doing consult their future interests, even if small sacrifices in the present are necessary.

SHIPMENTS AND STOCK.

SHIPMENTS REDUCED TO 43 GAL. PER BARREL.

	Ref'd	Crude Equal	Crude.	Totals
O. C. & A. R. R..	16,731	23,901	125,157	149,058
A. & G. W. R. W.	108	154	72,540	72,694
A. V. R. R.....	78	111	143,652	143,763
U. & T. R. R.....	21,513	30,732	12,812	43,544
J. & F. R. R.....	0	0	132,078	132,078
By River.....	0	0	0	0
Total.....	38,430	54,898	486,239	541,137

Stock at Wells July 31st..... 100,891
 Stock in Iron Tanks July 31st..... 402,303
 In hand of Refiners and Pipe Companies, not reported in the above.. 31,000

Total..... 534,194

Total shipments for June (bbls.).... 501,754
 Total stock on hand June 30th, (bbls.) 553,974

In reducing Refined Oil to "Crude Equal," as per above table, we calculate on the basis that 100 barrels of Crude produces 70 barrels of Refined.

The Petroleum Monthly.

REPORT OF THE PETROLEUM PRODUCERS' ASSOCIATION,

FOR THE MONTH OF JULY, 1871.

DISTRICTS REPRESENTED.	No. Bbls. Oil on hand at wells at close of month.	Daily average for the mo., containing 31 days.	No. wells prod'g during the mo'th.	Daily av- erage, per well for month	Wells being drill'd.	No. of barrels in Iron Tanks.
1 Parker's Landing	22,662	2,608.4	468	5.5	121	20,370
2 Emlenton	225	42	19	2.2		
3 Scrubgrass	648	118.5	43	2.7	3	
4 Foster		38	24	1.5	2	
5 Coal City	1,368	129.6	26	5	3	
6 Prentice, Angell, Co	5,800	496.8	26	19.1	3	5,000
7 Cochran	400	76	60	1.3		
8 Franklin	3,350	211.9	77	2.7	6	11,929
9 Reno	600	293.5	36	8.1		
10 Oil City	1,961	399.5	159	2.5	5	46,645
11 Venango City	1,200	648.6	91	7.1	48	25,943
12 Siverly		72	28	2.6	4	
13 Oleopolis		41	16	2.5		21,500
14 West Hickory	15,045	1,330.2	173	7.7	7	6,585
15 Tidioute	7,749	935.6	121	7.7	20	75,771
16 Economy	5,108	147	32	4.6		
17 Holmden	316	172.7	55	3.1	7	1,370
18 West Pithole	400	229.7	88	2.6	2	
19 McClintoc' ville...	770	159.2	56	2.8	5	
20 Rouseville	465	540.1	137	3.9	2	1,400
21 Lower Cherry Run	380	330	101	3.2	2	
22 Rynd & Steele	1,900	130	47	2.7	2	3,300
23 Blood & Tarr	2,100	192	60	3.2	2	1,000
24 Columbia	8,588	870	137	6.3	3	16,524
25 Moffat	2,200	358	120	3	6	
26 Niagara	1,408	113.2	50	2.2		
27 Wood & Stevenson	328	65.6	23	2.8		17,863
28 Petroleum Centre	380	220	46	4.8		41,212
29 McElheny	140	58.5	29	2		51,618
30 Sherman		15	4	3.7		2,147
31 Clinton	670	50	26	1.9	1	
32 Great Republic...	1,350	432.8	159	2.7	6	
33 Atkinon	487	336.2	36	3.8	1	
34 Shannburg	1,196	268.9	75	3.6		
35 Keech Farm		61.2	34	1.8	1	
36 Independent	1,600	257	82	3.1	1	
37 National	199	113.7	39	2.9		8,912
38 Davis	41	29.6	12	2.5		
39 Armstrong		120	41	3	1	
40 Vesta & Hebert...	530	55	14	4	1	
41 Gerow	790	143.2	49	2.9	3	
42 Nettleton	60	38.4	16	2.4	1	
43 Enterprise	557	137.1	24	5.7	8	
44 Bean	600	262.7	131	2		
45 Titusville	6,350	1,318.9	165	7.9	40	17,846
46 Armstrong Run...	1,000	256.4	25	10.2	12	
47 Miller & Shaffer...						25,368
Totals	100,891	14,725.3	3,280	4.5	329	402,303

N. B.—The amount of Lubricating Oil produced during July was 6,570 barrels.

Petroleum Monthly Advertiser.

CRESCENT TUBE WORKS.

EVANS, DALZELL & CO.,

PITTSBURG, PENNA.

DEALERS WILL CALL ON

E. W. STRATTON.

OFFICE:

BRYAN, DILLINGHAM & CO'S.

FRANKLIN STREET,

TITUSVILLE, PA.

THE EXCELSIOR LIFE INSURANCE CO. OF NEW YORK.

HOME OFFICE:

Nos. 68 & 70 WILLIAM STREET, NEW YORK.

CHAS. N. MORGAN, President.

BUTLER WARD, Secretary.

J. H. HILLARD, Gen'l Agent for Pennsylvania,

Office—N. E. CORNER FIFTH AND WALNUT STS.,

PHILADELPHIA, PENNA.

This Company has all the usual Endowment Plans of Insurance used by other good companies, and in addition to the Endowment Plan, all Policies can be converted into Cash in Five Years from the date thereof, at the option of the Policy holder. Even the ordinary Life Policy is convertible into cash in the same time, thus making all policies Endowment Policies, and also removing the general objection to Life Insurance, viz.: *investing your money where you can never use it yourself.*

Send for Circular.

AGENTS WANTED THROUGHOUT THE STATE

Where the territory is not already taken up.

BOSTON IRON WORKS,

JAMES SMITH, Proprietor,

OTTER STREET, NEAR J. & P. RAILROAD,

FRANKLIN, PENNA.,

Manufactures Oil Well Rig Irons, Casing Heads or Stuffing Boxes,
Plows, and all kinds of Castings, Drillings, Drilling Tools, &c.

Also sole manufacturer of the

Morahan and Roberts Sand Pumps.

THE

Titusville Morning Herald,

ESTABLISHED JUNE 14, 1865,

Is the acknowledged organ of the Petroleum interest of the United States. Its current reports of the developments throughout the oil territory in the United States and Canada; its daily review of the market and list of actual sales; its telegraphic reports of the market at Pittsburg, Cleveland, Philadelphia, Baltimore, New York and European marts, together with its "Monthly Report," make it a necessity to every man engaged in the Petroleum trade, either as an Operator, Broker, Refiner, Merchant, or Exporter. It publishes the full Associated Press reports, the general and local news of the day. The Weekly Edition is an epitome of the daily edition.

TERMS:

Daily, per annum.....	\$10.00
Weekly.....	2.00
Monthly Report, in form of a Circular.....	1.50

The Monthly Report is published in both the Daily and Weekly.

Address

BLOSS BROS. & COGSWELL,

TITUSVILLE, PENNA.

W. W. BLOSS, } *Editors.*
H. C. BLOSS, }
C. C. LEONARD, *Oil Reporter.*
J. H. COGSWELL, *Business Manager.*
Titusville, Pa., Nov. 1st, 1870.

PETROLEUM IRON WORKS.

BRYAN, DILLINGHAM & CO.,
Machinists, Iron & Brass Founders, Forgers,

MANUFACTURERS OF

Engines, Boilers, Drilling Tools,
Circular, Mulay and Sash Saw Mills,
Pumping Rig, Walking Beam & Band Wheel Irons,

WHOLESALE AND RETAIL DEALERS IN

Tubing and Casing for Oil Wells,

Stuffing Boxes, Clamps, Swivels, Tongs, Brass and Iron Fittings for Steam and
Gas, Working Barrels and Valves of every kind, Snow's Patent
Liquid Packing Pump, with the late improvements.

IN ADDITION TO THE ABOVE WE HAVE IN FULL OPERATION A

BRASS FOUNDRY AND BRASS FURNISHING ROOM,

Where we do all kinds of Brass Work.

☞ NOTE.—Especial attention is called to our

NEW BOILER SHOP,

And its **HEAVY MACHINERY** for building **TANKS, STILLs, BOILERS,**
and making all **NECESSARY REPAIRS.**

N. B.—SOLE MANUFACTURERS OF

Guillod's Celebrated Steel Jars,
Crocker's Patent Check Valve, and
Griffin's Patent Water Packer,

NOW IN GENERAL USE.

ROBERTS' PATENT SAND PUMP,

Bly's Patent Sucker-Rod Adjuster.

WE ALSO FURNISH THE

LONG HOOK AND WOOD CONNECTIONS,

AT COST PRICE, WHOLESALE AND RETAIL.

All orders will be filled at short notice by

BRYAN, DILLINGHAM & CO.,
Titusville, Pa.

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J. DILLINGHAM.

M. H. PHILLIP.

H. N. TWOMBLY

HOTEL CARDS.

DUNCAN HOUSE, CARVER HOUSE,
OIL CITY. *WARREN.*

CROSS & McOMBER, Proprietors. H. C. WILLIAMS, Proprietor.

CRITTENDEN HOUSE, IRVINETON HOUSE,
TITUSVILLE. *IRVINETON.*

E. Z. WILLIAMS, Proprietor. FRANK METZGAR, Proprietor.

GRANT HOUSE, RATHBUN HOUSE,
FRANKLIN. *ROUSEVILLE.*

GEO. C. TURNER, Proprietor. HANCOCK & LYONS, Proprietors.

CENTRAL HOUSE, M'CLINTOCK HOUSE,
Petroleum Center. *M'Clintockville, Pa.*

CROSS & McOMBER, Proprietors. T. H. WILLOUGHBY, Proprietor.
Bar and Billiard Rooms Attached.

OIL DEALERS' CARDS.

A. J. GREENFIELD,

Producer and Dealer in

PETROLEUM,
Rouseville, Pa.

R. H. LEE,

Broker and Dealer in

PETROLEUM,
Titusville, Pa.

CHAS. E. COOPER,

OIL BROKER,
Rouseville, Pa.

LINN & GORDON,

Brokers and Dealers in

PETROLEUM AND BENZINE.
Rouseville, Pa.

WILLIAM DIMAN,

DEALER IN CRUDE OIL
M'Clintockville, Pa.

PARKER, THOMPSON & CO.,

OIL BROKERS,
Oil City, Pa.

TORPEDOES.

THE

Roberts Petroleum Torpedo Co.,

OFFICE AT RED PLANING MILL,

Corner of Pine and Second Streets,

Titusville, Penn'a.

Owing to the large and increasing demand for the Roberts Torpedoes, and the late decision of the Commissioner of Patents, in refusing to Wm. Reed a patent, and the decision of Judge R. C. Grier, sustaining the Roberts Patent, they have lowered the price of their Torpedoes TWENTY PER CENT., so that every operator can afford to try a Torpedo before abandoning a well.

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Titusville, Church Run and vicinity,

H. H. Thomas, or Stephen Roof, Titusville, Pa.

Shamburg and vicinity,

George Irwin, Shamburg, Pa.

Enterprise, Pleasantville, Bean Farm and Pithole,

George W. Van Vliet, Pleasantville, Pa.

Tidioute and West Hickory,

Charles Clark, Tidioute, Pa.

Petroleum Centre and vicinity,

Levi Mason, Petroleum Centre, Pa.

Tarr and Blood Farms, Rouseville, Cherry Run and vicinity,

James Saunders, Tarr Farm, Pa.

Franklin,

Z. Wilber, Franklin, Pa.

Scrubgrass and Parker's Landing,

Richard W. Redfield, Scrubgrass, Pa

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T. F. Cook, Parkersburg, West Va.

Photographic Views of the Oil Regions.

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Views of the Oil Regions

IN ALL POINTS OF INTEREST AND ATTRACTION, CONSTANTLY
ON HAND AND FOR SALE.

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VALVE CUPS!

IMPORTANT TO OIL OPERATORS!!

THE ROUSEVILLE VALVE CUP,

(MILLER'S IMPROVED,)

Is the BEST cup ever made—because made from the best Oak and Union stock,
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Address,

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Constantly receiving new and elegant varieties of Season Goods. All the latest
styles.

ENGLISH MELTONS AND CHEVIOTS,

Beavers, Doeskins, Cloths and Cassimeres, of all colors.

Elegant Suiting, Fancy striped Cassimeres for Pantaloon. The best stock of
Gent's Furnishing Goods in the City, at the lowest prices. Satisfaction guaranteed.

WILLIAM J. INNIS & CO., OIL CITY, PA.

DO General Blacksmithing and Machine Work.



SUCKER ROD JOINTS.

EXPLANATION OF CUTS.

No. 1.

The Joint complete.

No. 2.

A longitudinal sectional view of a full Joint, showing the position of the wood in the socket when wedged, a glance at which must convince the most skeptical of the superiority of this Joint over any other.

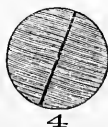
No. 3.

A view of the end of the Rod, when turned ready for the socket to be driven on, with the slot for the wedge, and the wedge about being entered.

No. 4.

Represents the end of the wood, and shows the proper way to saw the slot (across the grain) into which the wedge is to be driven.

The above description and accompanying cuts will enable any skilled person to make connection at the wells in a much shorter time than can be done with any other Rod, all the tools required being a small, fine saw, one of our *hollow augers* and wedges, which can be had at any hardware store *gratis*.



REPAIR STEAM ENGINES.

MAKE DRILLING TOOLS.



G. W. TIFFT, SONS & CO.

ENGINES,

12, 10 and 8 Horse Power

WITH OR WITHOUT LINK AND GOVERNOR.

BOILERS,

24, 14, 12 AND 10 HORSE POWER.

LOCOMOTIVE STYLE,

40, 26, 22 AND 18 HORSE POWER.

STATIONARY TUBULAR.

BAUGHTON & CHANDLER, Agents,

ROOM No. 9, CHASE & STEWART'S BLOCK,

TITUSVILLE, PA.

DAVIS, FOSTER & CO.,
REAL ESTATE AGENTS,

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LIBERTY STREET, FRANKLIN, PA.

Real Estate bought and sold, Houses Rented, Taxes paid for parties residing at a distance, and all business pertaining to a Real Estate Agency promptly attended to.

Special attention given to Oil Lands, Oil Leases and Oil Interests generally.

FRANKLIN, PA., INSURANCE AGENCY,

\$100,000,000.00

OF CAPITAL REPRESENTED.

LIFE COMPANIES.

Mutual Life of New York,	- - - - -	\$45,000,000.00
Railway Passenger Accident,	- - - - -	365,000.00

FIRE COMPANIES.

Ætna, of Hartford,	- - - - -	\$ 5,782,635.00
Home, of New York,	- - - - -	4,575,000.00
Ins. Co. of North America,	- - - - -	3,000,000.00
Franklin, of Philadelphia,	- - - - -	3,000,000.00
Germania, of New York,	- - - - -	1,100,000.00
Security, of New York,	- - - - -	2,250,000.00
Pacific, of San Francisco (gold),	- - - - -	1,700,000.00
Lycoming, of Pennsylvania,	- - - - -	5,400,000.00
Peoples, of Worcester, Mass.,	- - - - -	850,000.00
Liverpool and London and Globe (gold),	- - - - -	17,000,000.00
Royal, of Liverpool (gold),	- - - - -	8,000,000.00

And other first-class companies. All kinds of Insurance at reasonable rates. Oil insured in store and in transit—in the very best companies. We also make dwelling and farm risks a specialty.

DAVIS, FOSTER & CO.,
Franklin, Pa.

Petroleum Monthly Advertiser.

**R. J. BOTTNER,
WATCHMAKER & JEWELER,**

AND DEALER IN

**Jewels, Watches, Diamonds,
JEWELRY & CLOCKS,**

CENTER STREET,
OIL CITY,

And MAIN STREET,
ROUSEVILLE.

JAMES TYSON,

AGENT FOR

**ALLISON & SON'S
TUBING AND CASING.**

LARGE CASING A SPECIALTY.

Five and three-sixteenths, five and five-eighths and six and a quarter inch.
Also, one-eighth, one-fourth, three-eighths, one-half, one, one and a quarter,
one and a half and two inch

READING WELD BUTT PIPE,

To which we especially call the attention of operators.

BEST MANUFACTURE OF WELL FITTINGS.

EXPANSION JOINTS.

ROUSEVILLE.

T. STRUTHERS, President.
H. W. BROWN, General Manager.

A. H. McKELVY, Treasurer.
T. E. STRUTHERS, Secretary.

ESTABLISHED, 1851.

INCORPORATED, 1871.

BROWN & STRUTHERS' IRON WORKS

FOUNDERS AND MACHINISTS,

WARREN, PA.

MANUFACTURERS OF

Engines and Boilers,

FROM 8 TO 150 HORSE POWER.

OIL ENGINES A SPECIALTY.

Our patterns are made with especial reference to the wants of Oil Operators; they secure

DURABILITY, SIMPLICITY, ECONOMY.

These Engines are heavily built, with $3\frac{3}{4}$ inch centre connections; shaft and everything in proportion.

WILL OUTLAST,

Without getting out of order, TWO COMMON, cheaply constructed machines.

THE BEST IS CHEAPEST.

Great economy in fuel a second strong point. The best operators use them. Orders received daily from all parts of the oil region. All work guaranteed.

WE ALSO MANUFACTURE

CIRCULAR SAW MILLS,

Barlow's Rotary Cutting Mulay and Gangs

FOR THE UNITED STATES.

And all Machinery for Lumbering or Tanning Business.

BROWN & STRUTHERS.

K. Brett & Sons, Agents, Titusville, Penna.

Oil Creek and Alleghany Railroad.

SOUTHWARD TRAINS.

NORTHWARD TRAINS.

Stations.	1st CLASS.			2d CLASS.			Stations.	1st CLASS.			2d CLASS.		
	4	2	6	10	14	20		5	3	1	13	9	19
CORRY.....	A. M.	A. M.	P. M.	A. M.	A. M.	P. M.	IRVINGTON.....	P. M.	P. M.	A. M.	A. M.	A. M.	A. M.
Spartansburg.....	6 16	11 00	5 50	8 00	1 10		TIDIOUTE.....	12 45	5 05	6 00	7 45		
Titusville.....	6 42	11 35	6 24	9 10	1 50		Trunkville.....	1 28	5 47	7 20	9 05		
Miller Farm.....	7 35	12 25	7 25	A. M.	11 20	3 05	Tionesta.....	1 39	5 49	7 30	9 25		
P. CENTRE.....	8 02	1 03	7 59	6 56	12 15	4 00	Oleopolis.....	1 45	6 05	8 15	10 15		
Tarr Farm.....	8 25	1 25	8 23	7 55	1 05	4 45	OIL CITY.....	2 47	7 03	10 05	1 03		
Rouseville.....	8 28	1 28	8 30	8 10	1 55	5 00	Rouseville.....	A. M.	3 15	7 35	10 55	1 50	
OIL CITY.....	8 40	1 38	8 42	8 30	2 25	5 15	Tarr Farm.....	6 00	3 20	7 40	11 30	2 10	9 20
Oleopolis.....	9 10	2 05	9 15	9 20	3 20	6 00	P. CENTRE.....	6 16	3 35	7 59	12 10	2 30	9 37
Tionesta.....	9 15	2 10		10 15	3 40		Miller Farm.....	6 25	3 45	8 10	12 38	2 55	9 49
Trunkville.....	9 45	2 36		11 10	4 25		Titusville.....	6 34	3 55	8 21	1 05	3 20	10 00
TIDIOUTE.....	10 23	3 12		12 30	5 37		Spartansburg.....	6 36	3 59	8 23	1 25	3 33	10 02
Irvington.....	10 54	3 41		1 43	6 43		CORRY.....	6 56	4 20	8 44	2 15	4 40	10 20
	11 11	3 58		2 24	7 10								
	11 12	4 00		2 45	7 25								
	12 01	4 40		4 00	8 40								

JOHN PITCAIRN, Jr., General Manager.

Erie Railway—Columbus Time.

EASTWARD.

No. 12.	Oil City.	Meadville.	Corry.	New York.
No. 8.	9 15 a. m.	11 18 a. m.	12 50 p. m.	7 00 a. m.
	3 50 p. m.	4 33 p. m.	9 35 p. m.	3 10 p. m.

WESTWARD.

No. 1.	New York.	Corry.	Meadville.	Oil City.
No. 7.	9 00 a. m.	12 01 a. m.	6 40 a. m.	8 45 a. m.
	5 30 p. m.	12 51 p. m.	3 00 p. m.	6 25 p. m.

L. D. RUCKER, General Superintendent.

WM. R. BARR, General Passenger Agent.

Philadelphia and Erie Railway.

SUMMER TIME TABLE.

EASTWARD TRAINS.					WESTWARD TRAINS.				
Mail.....	Erie.	Corry.	Warr'n	Phila.	Phila.	Warr'n	Corry.	Erie.	
Erie Express	11 30 am	1 08 pm	2 17 pm	6 30 am	7 10 pm	1 14 pm	2 30 pm	3 50 pm	
Warr'n Accom.	9 00 pm	10 45 pm	11 51 pm	5 50 pm	Erie Express	12 30 pm	4 48 am	6 20 am	7 40 am
Erie Accom.	5 00 pm	7 00 pm	8 20 pm	—	Warr'n Accom.	—	7 15 am	8 40 am	10 25 pm
	7 50 am	10 15 am	11 40 am	—	Erie Accom.	—	5 00 pm	6 55 pm	8 3 pm

WM. A. BALDWIN, General Superintendent.

L. S. & M. S. Railway.

FRANKLIN DIVISION.

WESTWARD TRAINS.					EASTWARD TRAINS.				
No. 1 Mail.....	Oil City.	Franklin.	Jamestown.		No. 10 Freight.	Jamestown.	Franklin.	Oil City	
" 9 Freight.	9 15 am	9 50 am	11 30 am		" 6 "	1 10 am	4 26 am	5 00 am	
" 5 Accom.	11 10 am	11 52 am	3 45 pm		" 8 "	7 00 am	11 00 am	11 50 am	
" 13 Freight.	2 10 pm	2 58 pm	6 15 pm		" 2 Mail.....	6 40 am	11 52 am	12 40 pm	
	6 00 pm	6 48 pm	11 00 pm			1 05 pm	2 58 pm	3 35 pm	

GEO. H. MCINTIRE, Superintendent, Stoneboro, Pa.

Alleghany Valley Railroad.

CONNECTING PITTSBURG WITH BUFFALO—OIL REGIONS ROUTE.

Monday, May 22, 1871.

NORTHWARD.				STATIONS.				SOUTHWARD.			
P. M.	P. M.	A. M.	Depart.					Arrive.	P. M.	P. M.	A. M.
11 00	12 30	9 10		Pittsburg.....					7 55	6 00	6 50
3 55	4 45	1 15		Parkers.....					4 22	12 25	2 30
7 00	8 00	3 50		Oil City.....					2 10	9 40	11 50
8 45	9 22	5 32		Titusville.....					12 45	8 02	10 20
10 08	10 40	6 50		Corry.....					11 00	6 35	8 35
12 25		9 10		Brocton.....					8 35		6 30
2 00		10 00		Buffalo.....					6 05		3 45
P. M.	P. M.	P. M.	Arrive.					Depart.	A. M.	A. M.	P. M.

Silver Palace Sleeping Cars on Night Express Trains both ways between Pittsburg and Corry.

J. J. LAWRENCE, General Superintendent.

THOS. M. KING, Assistant Superintendent.

CONNECTING WITH PENNSYLVANIA RAILROAD.

EASTWARD TRAINS.				WESTWARD TRAINS.			
Cincinnati Express	Pittsbg	Harrisbg	Philad'a	Philad'a	Harrisbg	Pittsburg	
Pacific Express.....	1 00 pm	10 40 pm	3 00 am	7 10 pm	11 45 pm	10 10 am	
Philadelphia Exp....	2 00 am	11 25 am	3 05 pm	9 50 pm	1 50 am	10 30 am	
	4 30 pm	2 30 am	6 30 am	12 30 pm	4 45 am	1 30 pm	

A. J. CASSA T, General Superintendent, Altoona, Pa.